Forest Ecology and Management, 51 (1992) 377–379
Elsevier Science Publishers B.V., Amsterdam

Contents of *Forest Ecology and Management*, Volume 51

VOL. 51 NOS. 1–3 **AUGUST 15th 1992**

Special Issue: Acidic Deposition, its Nature and Impacts. Atmospheric Pollution and Forests

Preface

Atmospheric pollution and forests
P.H. Freer-Smith (Farnham, UK) 1

I Surveys of forest decline and regional studies

Evaluating changes in forest condition potentially related to acidic deposition: an example using red spruce
G.A. Reams and C.E. Peterson, Jr. (Corvallis, OR, USA) 5

Forest condition and air pollution in the United Kingdom
J.L. Innes (Farnham, UK) 17

Nitrogen-induced nutritional imbalances—a contributing factor to Norway spruce decline in the Bohemian Forest (Austria)
K. Katzensteiner, G. Glatzel (Vienna, Austria) and M. Kazda (Duesseldorf, Germany) 29

Growth and physiological changes in red spruce saplings associated with acidic deposition at high elevations in the southern Appalachians, USA
S.B. McLaughlin (Oak Ridge, TN, USA) and M.J. Tjoelker (Madison, WI, USA) 43

Forest decline in Nanshan, China
Y.-M. Bian (Nanjing, China) and S.-W. Yu (Shanghai, China) 53

II Symptomatology and diagnosis of forest decline

The application of early diagnostic tests for tree dieback to the Ontario situation
W.D. McIlveen (Toronto, Ont., Canada) 61

Effects of ambient levels of airborne chemicals on freezing resistance of red spruce foliage
D.R. Vann, G.R. Strimbeck and A.H. Johnson (Philadelphia, PA, USA) 69

Monitoring in 1989 of Mediterranean tree condition and nutritional status in southern Tuscany, Italy
F. Bussotti, R. Gellini, M. Ferretti, E. Cenni (Florence, Italy), R. Pietrini and G. Sbrilli (Piombino, Italy) 81

Effects of long-term exposure to simulated acid rain on conifer needle ultrastructure and hardening status
J. Bäck and S. Huttunen (Oulu, Finland) 95

III Techniques for measuring effects of pollutants on growth of young and mature trees

Comparison of structural changes in red spruce (*Picea rubens* Sarg.) during cold

hardening in mature trees and in seedlings used in pollutant exposure studies
J. Fincher (Ithaca, NY, USA) 105
A new method for exposing mature trees to ozone episodes
J.J.J. Wiltshire, C.J. Wright and M.H. Unsworth (Loughborough, UK) 115
The Liphook Forest Fumigation Project: studies of sulphur dioxide and ozone effects on coniferous trees
A.R. McLeod, P.J.A. Shaw (Leatherhead, UK) and M.R. Holland (Ascot, UK) 121
Assessment of ozone effects on beech (*Fagus sylvatica*) by injection of a protectant chemical
N. Ainsworth and M.R. Ashmore (Ascot, UK) 129
Quantifying the direct effects of SO_2 and O_3 on forest growth
G.M.J. Mohren, I.T.M. Jorritsma, A.W.M. Vermetten, M.J. Kropff, W.L.M. Smeets (Wageningen, Netherlands) and A. Tiktak (Amsterdam, Netherlands) 137

IV Direct effects of pollutants on trees
Impact of gaseous air pollution on leaf growth of hybrid poplar
G. Taylor (Brighton, UK) and D.L. Frost (Lancaster, UK) 151
Ozone exposure–response relationships for photosynthesis in genetic strains of loblolly pine seedlings
C.J. Richardson, T.W. Sasek, E.A. Fendick (Durham, NC, USA) and L.W. Kress (Research Triangle Park, NC, USA) 163
Immediate and long-term (memory) responses of *Picea abies* to a single growing season of SO_2-exposure or moderate drought
M. Tesche (Dresden, Germany) 179
Effects of ozone and water deficit on the growth and physiology of *Fagus sylvatica*
S.R. Davidson, M.R. Ashmore and C. Garretty (Ascot, UK) 187
Impacts of acidic deposition on high-elevation spruce-fir forests: results from the Spruce-Fir Research Cooperative
M.B. Adams and C. Eagar (Radnor, PA, USA) 195

V Direct and indirect effects of pollutants, particularly nitrogen
Effects of a decrease in atmospheric deposition of nitrogen and sulphur on the mineral balance and vitality of a Scots pine stand in the Netherlands
H.F.G. van Dijk, A.W. Boxman and J.G.M. Roelofs (Nijmegen, Netherlands) 207
Impact of foliar and soil applications of nitrogen on the nutritional status of a young Sitka spruce plantation
R.C. Thomas and H.G. Miller (Aberdeen, UK) 217
The combined effect of mineral nutrition and soluble aluminium on *Pinus sylvestris* and *Picea abies* seedlings
H. Ilvesniemi (Helsinki, Finland) 227
Above-ground N-uptake from wet deposition by Norway spruce (*Picea abies* Karst.)
G. Eilers, R. Brumme (Göttingen, Germany) and E. Matzner (Bayreuth, Germany) 239

VOL. 51 NO. 4 **AUGUST 31st 1992**

The occurrence of the large pine weevil, *Hylobius abietis* (L.), in individual forest zones
V. Zumr and P. Starý (České Budějovice, Czechoslovakia) 251
Water use efficiency and transpiration of *Robinia, Liquidambar,* and *Platanus* sprouts in the southeastern USA
S.M. Raper, K. Steinbeck (Athens, GA, USA), I.S. Moss (Prince George, B.C., Canada) and D. Whitehead (Rotorua, New Zealand) 259

Response of *Eucalyptus regnans* F. Muell. to thinning and urea fertilization in New Zealand
M.G. Messina (College Station, TX, USA) 269
Estimating diameter increment by DBH class with horizontal point sampling data
T.B. Lynch and M.M. Huebschmann (Stillwater, OK, USA) 285
Small-scale spatial patterns of trees in a mixed *Pinus sylvestris–Fagus sylvatica* forest
J. Szwagrzyk (Cracow, Poland) 301
Value of selectively cut deciduous forest for understory herb conservation: an experimental assessment
R.J. Reader and B.D. Bricker (Guelph, Ont., Canada) 317
Annual variation in needle fall of a loblolly pine stand in relation to climate and stand density
T.C. Hennessey, R.F. Wittwer (Stillwater, OK, USA), P.M. Dougherty (Athens, GA, USA) and B.M. Cregg (Lincoln, NE, USA) 329
Role of periodical cicadas (Homoptera: Cicadidae: *Magicicada*) in forest nutrient cycles
G.L. Wheeler, K.S. Williams and K.G. Smith (Fayetteville, AR, USA) 339
Nutrient retranslocation in three *Pinus sylvestris* stands
H.-S. Helmisaari (Vantaa, Finland) 347

Author Index 369

Subject Index 373